

**CLAIMS:**

1. A diesel engine with a supercharger including a  
supercharger for taking in and pressurizing outside air and  
5 supplying the pressurized supercharged air into a cylinder, and  
a heat exchanger, which is provided in a supercharged air  
passage from an outlet port of said supercharger to an inlet port  
of said cylinder and cools the supercharged air from said  
supercharger,
- 10 wherein said heat exchanger is a hybrid type of heat  
exchanger comprising  
a first heat exchanger for carrying out heat exchange between  
the supercharged air from the outlet port of said supercharger  
and a first heat exchange medium, and  
15 a second heat exchanger for carrying out heat exchange between  
the supercharged air from an outlet port of said first heat  
exchanger and a second heat exchange medium having higher  
temperature than said first heat exchange medium, and  
supplying the supercharged air after the heat exchange with  
20 said second heat exchange medium to said cylinder.
2. The diesel engine with the supercharger in accordance  
with Claim 1,  
wherein the engine is a water cooling type of engine  
25 with the supercharger using cooling water,

wherein said first heat exchange medium is outside air,  
and

wherein said second heat exchange medium is cooling  
water from said water cooling type of engine.

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3. The diesel engine with the supercharger in accordance  
with Claim 1,

wherein a fuel used is a water emulsion fuel.

10 4. The diesel engine with the supercharger in accordance  
with Claim 3,

wherein the engine is a water cooling type of engine  
with the supercharger using cooling water,

wherein said first heat exchange medium is outside air,

15 and

wherein said second heat exchange medium is cooling  
water from said water cooling type of engine.

5. The diesel engine with the supercharger in accordance  
20 with Claim 1 or Claim 3, further comprising:

load detecting means for detecting load of the engine;

and

control means for receiving a detection signal from said  
load detecting means and controlling flow of said second heat  
25 exchange medium.

6. The diesel engine with the supercharger in accordance with Claim 2 or Claim 4, further comprising:

load detecting means for detecting load of said water cooling type of engine; and

5 control means for receiving a detection signal from said load detecting means and controlling flow of cooling water from said water cooling type of engine.

7. The diesel engine with the supercharger in accordance with Claim 1 or Claim 3, further comprising:

a pressure sensor which is provided between an outlet port of a compressor of said supercharger and an inlet port of said cylinder and detects supercharged air pressure; and

15 control means for receiving a detection signal from said pressure sensor and controlling flow of said second heat exchange medium,

wherein the engine is used at an almost constant engine speed.

20 8. The diesel engine with the supercharger in accordance with Claim 2 or Claim 4, further comprising:

a pressure sensor which is provided between an outlet port of a compressor of said supercharger and an inlet port of said cylinder and detects supercharged air pressure; and

25 control means for receiving a detection signal from said

pressure sensor and controlling flow of cooling water from said water cooling type of engine,

wherein said water cooling type of engine is used at an almost constant engine speed.

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9. A diesel engine with a supercharger including a supercharger for taking in and pressurizing outside air and supplying the pressurized supercharged air into a cylinder, and a heat exchanger, which is provided in a supercharged air passage from an outlet port of said supercharger to an inlet port of said cylinder and cools the supercharged air from said supercharger,

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wherein a fuel used is a fuel inferior to light oil in ignitability, and

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wherein said diesel engine with the supercharger comprises means for maintaining temperature of the supercharged air supplied to said cylinder at a predetermined value.

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